

REMARKS

The Office Action dated September 3, 2010, has been received and reviewed. Claims 1 through 3, 6 through 12, 16, 18 through 47, 49 through 54, 57, 59, 60, 63 through 65, and 79 through 85 are currently pending in the application, of which claims 1 through 3, 6 through 12, 16, 18, 24 through 28, 52 through 54, 57, 59, 60, 64, and 65 are currently under examination. Claims 19 through 23, 29 through 47, 49 through 51, 63, and 79 through 85 are withdrawn from consideration as being drawn to non-elected inventions. Claims 1 through 3, 6 through 12, 16, 18, 24 through 28, 52 through 54, 57, 59, 60, 64, and 65 stand rejected. Applicants have amended claim 57, and respectfully request reconsideration of the application as amended herein.

Applicants note the amendment to claim 57 is made only to correct the improper dependent form of the claim 57 due to the previous canceling of claim 56. This amendment does not surrender any scope of the claims as previously presented.

Related Applications

The Examiner's attention is respectfully drawn to Applicants' amendment to the CROSS-REFERENCE TO RELATED APPLICATIONS, wherein related applications have been newly identified.

Claim Objections

Claim 57 is objected to under 37 C.F.R. § 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. Appropriate correction has been made.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 4,854,379 to Shaubach et al.

Claims 1, 6 through 12, 16, 26, and 28 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,854,379 to Shaubach et al. (hereinafter "Shaubach").

Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Unless a single prior art reference describes “all of the limitations claimed” **and** “all of the limitations [are] **arranged or combined in the same way** as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.” *Net MoneyIN Inc. v. VeriSign Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) (emphasis added). A single prior art reference must “clearly and unequivocally” describe the claimed invention “without *any* need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference.” *Id.* (citing *In re Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972)).

The 35 U.S.C. § 102(b) anticipation rejections of claims 1, 6 through 12, 16, 26, and 28 are improper because Shaubach does not inherently or expressly describe an evaporator for a heat transfer system comprising “a vapor removal channel located at an interface between the primary wick and the heated wall” and “a liquid flow channel located at an interface between the liquid barrier wall and the primary wick,” as recited in independent claim 1.

Referring to FIG. 4, Shaubach describes a heat pipe 28 configured to isolate an external artery structure 34 from effect by heat sources 36. *Shaubach*, col. 4, lines 39-55. A wick 12 covers the inside surface of heat pipe 28 and encloses vapor space 38. *Id.* An opening 30 in artery 32 is positioned on the side most remote from the heat source 36 and functions to supply liquid to the wick 40. *Id.*

However, Shaubach does not describe a vapor removal channel located at an interface between the wick and a heated wall and a liquid flow channel located at an interface between a liquid barrier wall and the wick. As shown in FIG. 4, the housing of the heat pipe 28 that may be effected by heat sources 36 (identified by the Examiner as a heated wall) does not include a vapor removal channel located at an interface between the housing of the heat pipe 28 and the wick 12. Rather, the vapor space 38 in the heat pipe 28 (identified by the Examiner as a vapor removal

channel) is located within the wick 12 and not at an interface between the heat pipe 28 and the wick 12.

Furthermore, as also shown in FIG. 4, the artery 32 (identified by the Examiner as a liquid barrier wall) does not include a liquid flow channel located at an interface between the artery 32 and the wick 12. Rather, the liquid flow channel in the external artery structure 34 (*i.e.*, opening 30 in the artery 32) is disposed within the wick 12 and not at an interface between the outer wall forming the artery 32 and the wick 12.

Therefore, as Shaubach does not expressly or inherently describe each and every element recited in independent claim 1, Applicants assert that claim 1 is not anticipated by Shaubach, and respectfully request that the Examiner withdraw the rejection of independent claim 1 under 35 U.S.C. § 102(b).

Applicants additionally assert that each of dependent claims 6 through 12, 16, 26, and 28 is allowable at least because each depends from claim 1, which is allowable. Therefore, Applicants assert that claims 6 through 12, 16, 26, and 28 are not anticipated by Shaubach, and respectfully request that the Examiner withdraw the rejection of dependent claims 6 through 12, 16, 26, and 28 under 35 U.S.C. § 102(b).

Regarding dependent claim 6, Applicants additionally assert that Shaubach does not describe an evaporator “wherein the vapor removal channel is formed in the heated wall,” as recited in dependent claim 6. As shown in FIG. 4, the housing of the heat pipe 28 does not include a vapor removal channel formed therein. Therefore, Applicants respectfully request that the Examiner withdraw the rejection of dependent claim 6 under 35 U.S.C. § 102(b) for this additional reason.

Regarding dependent claim 9, Applicants additionally assert that Shaubach does not describe an evaporator “wherein a portion of the vapor removal channel is formed by the heated wall and another portion of the vapor removal channel is formed by the primary wick,” as recited in dependent claim 9. As shown in FIG. 4, the housing of the heat pipe 28 does not include a portion of a vapor removal channel formed therein. Furthermore, the wick 12 does not include a portion of a vapor removal channel formed therein. Therefore, Applicants respectfully request

that the Examiner withdraw the rejection of dependent claim 9 under 35 U.S.C. § 102(b) for this additional reason.

Regarding dependent claim 12, Applicants additionally assert that Shaubach does not describe an evaporator “wherein the vapor removal channel formed in a surface of the primary wick,” as recited in dependent claim 12. As shown in FIG. 4, the wick 12 does not include a vapor removal channel formed therein. Therefore, Applicants respectfully request that the Examiner withdraw the rejection of dependent claim 12 under 35 U.S.C. § 102(b) for this additional reason.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on Shaubach

Claims 2, 3, 18, 24, 25, 52 through 54, 57, 59, 60 and 64 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shaubach. Applicants respectfully traverse this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness, the prior art reference itself (or references when combined) or “the inferences and creative steps that a person of ordinary skill in the art would [have] employ[ed]” at the time of the invention must teach or suggest all of the claim elements. *K.S.R. Intern. Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 82 U.S.P.Q.2d 1385 (2007); *see also* M.P.E.P. § 2143.03. Additionally, the Examiner must determine whether there is “an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *Id.* “[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.* Further, rejections on obviousness grounds “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* (quoting *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006)). Finally, to establish a *prima facie* case of obviousness there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant’s disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d

1356, 1367 (Fed. Cir. 2006); M.P.E.P. § 2144. Underlying the obvious determination is the fact that hindsight cannot be used. *KSR*, 550 U.S. at 421; *DyStar*, 464 F.3d at 1367.

1. Dependent Claims 2, 3, 18, 24, and 25

Claims 2, 3, 18, 24, and 25 depend from independent claim 1 and include each of the elements recited therein. As discussed above, Shaubach does not describe, teach, or suggest each and every element of claim 1.

Applicants further assert that, for the same reasons discussed above in relation to claim 1, Shaubach does not teach or suggest each and every element of claim 1. Furthermore, there is no teaching or suggestion in Shaubach to modify the heat pipe taught therein to include the elements of claim 1.

Therefore, claims 2, 3, 18, 24, and 25 are not obvious at least because independent claim 1, from which claims 2, 3, 18, 24, and 25 depend, is not obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

Furthermore, regarding dependent claim 24, Applicants additionally assert that Shaubach does not teach, suggest, or otherwise render obvious an evaporator “wherein the primary wick, the heated wall, and the liquid barrier wall are annular and coaxial,” as recited in dependent claim 24. As shown in FIG. 4, the housing of the heat pipe 28 that may be effected by heat sources 36 (identified by the Examiner as a heated wall) and the artery 32 (identified by the Examiner as a liquid barrier wall) are not coaxial. Therefore, Applicants assert that dependent claim 24 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of dependent claim 24 under 35 U.S.C. § 103(a) for this additional reason.

Regarding dependent claim 25, Applicants additionally assert that Shaubach does not teach, suggest, or otherwise render obvious an evaporator “wherein the heated wall is disposed inside the primary wick, which is disposed inside the liquid barrier wall,” as recited in dependent claim 25. As shown in FIG. 4, the housing of the heat pipe 28 that may be effected by heat sources 36 (identified by the Examiner as a heated wall) is not disposed inside the wick 12. Rather, the wick 12 is disposed inside the housing of the heat pipe 28. Therefore, Applicants

assert that dependent claim 25 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of dependent claim 25 under 35 U.S.C. § 103(a) for this additional reason.

2. Independent Claim 52 and Dependent Claims 53, 54, 57, 59, 60, and 64

The 35 U.S.C. § 103(a) obviousness rejections of claims 52 through 54, 57, 59, 60, and 64 are improper because Shaubach does not teach, suggest, or otherwise render obvious an evaporator for a heat transfer system comprising “a liquid barrier wall having an annular shape and being coaxial with the heated wall; a primary wick extending from a portion of the heated wall to a portion of the liquid barrier wall and being coaxial with the heated wall; a vapor removal channel located at an interface between the primary wick and the heated wall; and a liquid flow channel located at an interface between the liquid barrier wall and the primary wick,” as recited in independent claim 52.

For the same reasons discussed above with relation to claim 1, Shaubach does not describe, teach, or suggest each and every element of claim 52. Furthermore, Shaubach does not describe, teach, or suggest that the artery 32 (identified by the Examiner as a liquid barrier wall) and the housing of the heat pipe 28 that may be effected by heat sources 36 (identified by the Examiner as a heated wall) are coaxial. As shown in FIG. 4, the artery 32 and the housing of the heat pipe 28 are located apart from one another and do not share a common axis.

Finally, there is no teaching or suggestion in Shaubach to modify the heat pipe taught therein to include the elements of claim 52.

As Shaubach does not teach, suggest, or otherwise render obvious all the elements recited in independent claim 52, Applicants assert that independent claim 52 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of independent claim 52 under 35 U.S.C. § 103(a).

Furthermore, the nonobviousness of independent claim 52 precludes a rejection of claims 53, 54, 57, 59, 60, and 64, which depend therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 837 F.2d 1071, 1076, 5

U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988); M.P.E.P. § 2143.03. Therefore, Applicants request that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to claims 53, 54, 57, 59, 60, and 64, in addition to the rejection to independent claim 52.

Furthermore, regarding dependent claim 53, Applicants additionally assert that Shaubach does not teach, suggest, or otherwise render obvious an evaporator “wherein the heated wall is inside the primary wick, which is inside the liquid barrier wall,” as recited in dependent claim 53.

As shown in FIG. 4, the housing of the heat pipe 28 that may be effected by heat sources 36 (identified by the Examiner as a heated wall) is not disposed inside the wick 12. Rather, the wick 12 is disposed inside the housing of the heat pipe 28. Therefore, Applicants assert that dependent claim 53 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of dependent claim 53 under 35 U.S.C. § 103(a) for this additional reason.

Regarding dependent claim 59, Applicants additionally assert that Shaubach does not teach, suggest, or otherwise render obvious an evaporator “wherein the vapor removal channel is formed in the heated wall,” as recited in dependent claim 59. As shown in FIG. 4, the housing of the heat pipe 28 does not include a vapor removal channel formed therein. Therefore, Applicants assert that dependent claim 59 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of dependent claim 59 under 35 U.S.C. § 103(a) for this additional reason.

Regarding dependent claim 60, Applicants additionally assert that Shaubach does not teach, suggest, or otherwise render obvious an evaporator “wherein the vapor removal channel is formed in a portion of the primary wick and a portion of the heated wall,” as recited in dependent claim 60. As shown in FIG. 4, the housing of the heat pipe 28 does not include a portion of a vapor removal channel formed therein. Furthermore, the wick 12 does not include a portion of a vapor removal channel formed therein. Therefore, Applicants assert that dependent claim 60 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of dependent claim 60 under 35 U.S.C. § 103(a) for this additional reason.

Regarding dependent claim 64, Applicants additionally assert that Shaubach does not teach, suggest, or otherwise render obvious an evaporator “wherein the vapor removal channel is formed in the primary wick,” as recited in dependent claim 64. As shown in FIG. 4, the wick 12 does not include a vapor removal channel formed therein. Therefore, Applicants assert that dependent claim 64 would not have been obvious to a person of ordinary skill in the art at the time the invention was made considering Shaubach, and request that the Examiner withdraw the rejection of dependent claim 64 under 35 U.S.C. § 103(a) for this additional reason.

Obviousness Rejection Based on U.S. Patent No. 4,854,379 to Shaubach et al. in view of U.S. Patent Publication No. 2002/0062648 to Ghoshal

Claims 27 and 65 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shaubach in view of U.S. Patent Publication No. 2002/0062648 to Ghoshal (hereinafter “Ghoshal”). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 27 and 65 depend from one of independent claim 1 or independent claim 52 and include each of the elements recited therein. As discussed above, Shaubach does not describe, teach, or suggest each and every element of claim 1 or claim 52.

Ghoshal teaches an apparatus for dense chip packaging using heat pipes and thermoelectric coolers. *Ghoshal*, Abstract. However, Ghoshal does not appear to remedy the many deficiencies of Shaubach in this regard discussed hereinabove.

Therefore, claims 27 and 65 are not obvious at least because independent claim 1 and independent claim 52, from which claims 27 and 65 depend, are not obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

Withdrawn Claims/Rejoinder

As previously noted, claims 19 through 23 are withdrawn from consideration as directed to a nonelected invention. However, Applicants note that claims 19 through 23 depend from claim 1. Therefore, claims 19 through 23 should be rejoined and allowed in conjunction with the allowance of claim 1.

Further, claim 63 is withdrawn from consideration as directed to a nonelected invention. However, Applicants note that claim 63 depends from claim 52. Therefore, claim 63 should be rejoined and allowed in conjunction with the allowance of claim 52.

Finally, claims 29 through 47 and 49 through 51 are withdrawn from consideration as directed to a nonelected invention. However, Applicants note that independent claim 29, as previously presented, and claims 30 through 47 and 49 through 51 depending therefrom, require all the limitations of claim 1. Therefore, independent claim 29, and claims 30 through 47 and 49 through 51 depending therefrom, should be rejoined and allowed in conjunction with the allowance of claim 1.

ENTRY OF AMENDMENTS

The amendment to claim 57 is supported by the as-filed specification and drawings and do not add any new matter to the application. Further, this amendment does not raise new issues or require a further search.

CONCLUSION

Claims 1 through 3, 6 through 12, 16, 18 through 47, 49 through 54, 57, 59, 60, 63 through 65, and 79 through 85 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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